DESCRIPTION OF SEA TURTLES DISTRIBUTION RESEARCH IN NORTH CAROLINA

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We began an evaluation of methodologies to determine the distribution and species composition of the sea turtle fauna and the importance of the extensive estuarine waters of North Carolina to the turtles. The Pamlico-Albemarle Estuarine Complex of North Carolina (6,630 km^2) is the second largest estuarine system in the United States and the largest estuarine system in the southeast. Until stocks became depleted around the turn of the century (Pope 1939), the loggerhead, green and Kemp's ridley sea turtles supported a fishery which was primarily prosecuted in Pamlico, Core and Bogue Sounds and the Newport River (Figure 1) (True 1887, Coker 1906, 1951). Little else is known about sea turtles in the inshore waters of North Carolina. The field study period was from July through December, 1988 and was supported by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, Office of Protected Resources.

The first method evaluated voluntary public involvement. Using a poster, we asked the public to report any sightings of sea turtles. Attached to the poster was a gummed pad of prepaid, addressed postcards that asked for the date, location, and species sighted and whether the turtle was dead or alive. About 450 posters have been placed along the coast at a variety of locations including marinas, piers, bait and tackle shops, commercial fish houses, dive shops, public aquaria, airports, etc. Private ferries, tour boats, and research vessels carried sighting logs and also contributed sighting locations. Overall, this program reported 211 turtles of which 32% were dead. Most returns were from the ocean side of the barrier islands, particularly in the Cape Lookout area. We had coast-wide distribution of the posters by late fall and released an article to the newspapers promoting public participation. We hope to reap the benefits of these efforts in 1989.

The second method evaluated the use of public ferry boats as survey platforms. We placed sighting logs on all of the North Carolina Department of Transportation ferries. The ferries cross the mouth of the Cape Fear River, Pamlico Sound, the lower Neuse and Pamlico Rivers, Hatteras Inlet and Currituck Sound. The ferry boat captains recorded the number of passages made daily and location of any turtle sighted, alive or dead. The number of live turtles sighted ($n=13$) was small (Table 1). Most live turtles were sighted at Hatteras Inlet during the warmer early fall months. None were seen in November and December, although other sources revealed turtles in the eastern portions of Pamlico and Core sounds during these months. Twelve turtles were reported dead and most reports were from the ferries crossing the inlets of Pamlico Sound in September and October.

The third method evaluated was aerial surveys over Pamlico and Core Sounds. We divided the Sounds into 3 areas: Core Sound (34°41' to 35° N), southern Pamlico Sound (35° to 35°20' N) and northern Pamlico Sound (35°20' to 35°48' N). Transects in Core Sound were spaced to survey 30% of the Sound; the design for southern and northern Pamlico Sounds was to survey approximately 8% of those areas. We were able to fly only the first two areas before the end of the year.

Core Sound, surveyed on November 1, yielded sightings of 14 turtles (Figure 2). All the turtles appeared to be small loggerheads, probably juveniles, except one which was small but did not appear to be a loggerhead. With the exception of two turtles seen together, turtles were solitary. Turtles were sighted either on the shoals of the eastern shore (where there are large meadows of seagrasses) or on the eastern edge of the channels. The survey of southern Pamlico Sound was conducted on November 15 and produced eight sea turtle sightings (Figure 3). Except for one turtle, all were seen in the eastern basin, particularly near Hatteras Inlet, or on Bluff Shoal which divides Pamlico Sound into east-west basins. Like Core Sound, much of the shoal area of Pamlico Sound behind the Outer Banks contains submerged vegetation.

To gather data on the species and size composition of the turtles in the inshore waters, we located fishermen who volunteered to tag and keep records of sea turtles incidentally captured in their nets (mainly pound nets). We obtained Endangered Species Permits for these fishermen, demonstrated tagging procedures and asked them to double-tag, measure, and photograph the turtles encountered in their fishing operations. Five cooperating fisherman tagged a total of 47 turtles (Table 2) and another 77 turtles were caught and released, including three Kemp's ridley turtles. Most tagged and released turtles were loggerheads (55-93 cm CCL), but green turtles (25-50 cm CCL) and Kemp's ridleys (23-43 cm CCL) were also tagged and released. During the 1988 study period 10 tagged turtles were recaptured. One was a 1986 headstarted turtle released near Naples, Florida; the others were recaptures of our own releases in 1988 which gave information about short-term movements.

All the green and Kemp's ridley sea turtles were captured and tagged in the fall; summer and early fall catches were exclusively loggerheads. The Pamlico and Core Sound fishermen related an annual pattern of multispecies catches early in the year (May and early June), loggerhead catches throughout the summer and early fall, and multispecies catches again in the fall with a high proportion of small turtles. This pattern may indicate immigration in the spring, sorting by habitat throughout the summer, and emigration in the fall.

In summary, we have demonstrated that immature green and Kemp's ridley sea turtles and loggerheads of all sizes utilize the inshore waters of Pamlico and Core Sounds, North Carolina. Continuation of the distribution work is needed to determine which areas of the Sounds are critical habitats. We shall continue to monitor the species and size composition with a long-term objective of estimating how many turtles utilize the Sounds.

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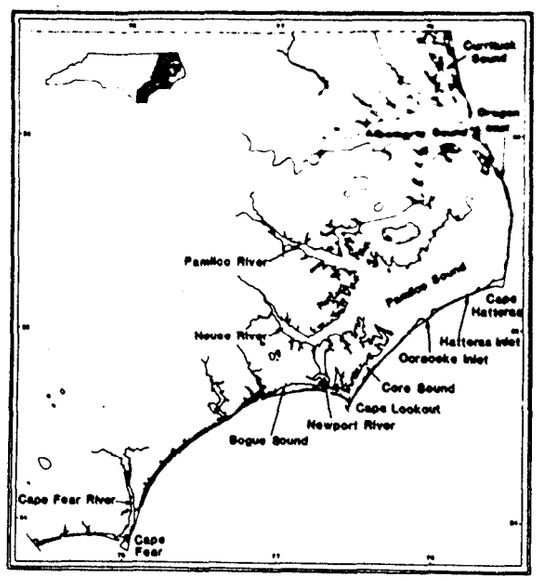

Figure 1 Coastal North Carolina

Table 1 Live turtles sighted on ferry passages made by the N.C. D.O.T.

	MONTH					
	AUG	SEPT	OCT	NOV	DEC	TOTAL
Ft Fisher – Southport	1	3	0	0	0	4
Cedar Is – Ocracoke	0	0	1	0	0	1
Swan Quarter – Ocracoke	0	0	0	0	0	0
Ocracoke – Hatteras	5	1	1	0	0	7
Cherry Branch – Minnesott	0	1	0	0	0	1
Aurora – Bayview	0	0	0	0	0	0
Currituck – Knots Is	0	0	0	0	0	0
Total	6	5	2	0	0	

Total Sightings = 13

Table 2 Sea turtle tagging summary 1988

	Species		
Month	Caretta caretta	Chelonia mydas	Lepidochelys kempi
June	5		
July	6		
August	7		
September	3		
October		5	2
November	9	7	2
December			1
Total	30	12	5

Figure 2 Aerial Survey of Core Sound, 1 November 1988

(Waters deeper than 6 ft. are shown stippled)

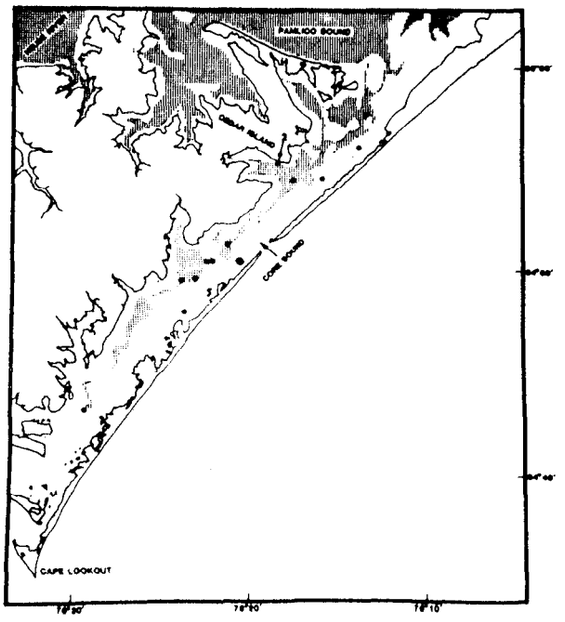

Figure 3 Aerial Survey of Southern Pamlico Sound, 15 Nov. 1988